

WHAT IS CLAIMED IS:

1           1.       A wireless human interface device configured to establish a link with a  
2 host, said device comprising:

3               a transceiver for transmitting data to and receiving data from a host transceiver  
4 unit, wherein said host transceiver unit is connected with said host;

5               a processor connected with said transceiver and configured to process data  
6 from said host and said human interface device, and

7               a power circuit connected with said processor and configured to regulate the  
8 power usage of said human interface device, wherein said power circuit comprises:

9                   a battery,

10                  a computer readable media having instructions thereon, wherein said  
11 instructions comprise

12                       routines for monitoring the operational state of said human  
13 interface device, and

14                       routines for controlling the operation of said human interface  
15 device using said operational state of said human interface  
16 device.

1           2.       The wireless human interface device of claim 1 wherein  
2               said routines for controlling the operation of said human interface device  
3 comprise a routine for keeping the transceiver at a lowered power level during the periods  
4 where the transceiver is not exchanging data with said host transceiver unit.

1           3.       The wireless human interface device of claim 2 wherein  
2               said routines for controlling the operation of said human interface device  
3 comprise a routine for adjusting the rate of data exchange between said device and said host  
4 transceiver unit to a higher rate when said device is transmitting data to said host transceiver  
5 unit, from a lower rate used for maintaining a synchronized link with said host transceiver  
6 unit.

1           4.       The wireless human interface device of claim 1 wherein  
2               said routines for controlling the operation of said human interface device  
3 comprise a routine for powering down the transceiver and said processor if the device  
4 remains in an idle state for more than a predetermined time period.

1           5.     The wireless human interface device of claim 4 wherein  
2           said routines for controlling the operation of said human interface device  
3     comprise:  
4           a routine for powering up said processor and said transceiver in response to an  
5     input to said device, and  
6           a routine for re-establishing a link with said device.

1           6.     The wireless human interface device of claim 1 wherein  
2           said power circuit comprises a voltage regulator to adjust the output voltage of  
3     said battery to a level desired for the operation of said processor.

1           7.     The wireless human interface device of claim 6 wherein voltage  
2     regulator lowers the output voltage.

1           8.     The wireless human interface device of claim 6 wherein voltage  
2     regulator boosts the output voltage.

1           9.     The wireless human interface device of claim 1 further comprising a  
2     motor connected with same processor and said power circuit to provide vibration feedback to  
3     an operator of said device.

1           10.    The wireless human interface device of claim 9 wherein  
2           said routines for controlling the operation of said human interface device  
3     further comprise a routine for:  
4           monitoring the battery voltage, and  
5           scaling the drive to said motor as a function of said battery voltage to provide  
6           a substantially constant motor output force regardless of the battery voltage.

1           11.    The wireless human interface device of claim 9 wherein  
2           said routines for controlling the operation of said human interface device  
3     further comprise a routine for providing a maximum motor output force at a minimum battery  
4     level

1           12.    The wireless human interface device of claim 9 wherein

2           said routines for controlling the operation of said human interface device  
3 further comprise a routine for:  
4           reducing the power delivered to said motor when said battery's voltage level is  
5 below a first threshold, and  
6           indicating the battery level to an operator of said device.

1           13.    The wireless human interface device of claim 12 wherein  
2           said reducing the power delivered to said motor when said battery's voltage  
3 level is below a threshold, includes:  
4           reducing the power to said motor to zero, when said battery's voltage level is  
5 below a second threshold, which is lower than said first threshold, and  
6           indicating the battery level to an operator of said device.

1           14.    The wireless human interface device of claim 1 further comprising a  
2 plurality of visual indicators connected with said processor and said power circuit, configured  
3 to display status information to an operator of said device.

1           15.    The wireless human interface device of claim 14 wherein  
2           said routines for controlling the operation of said human interface device  
3 further comprise a routine for:  
4           activating one of a plurality of said visual indicators when there is a change in  
5 said status information, and  
6           deactivating said same one visual indicators after a predetermined delay  
7 period.

1           16.    A wireless human interface device configured to establish a link with a  
2 host, said device comprising:  
3           a transceiver for transmitting data to and receiving data from a host transceiver  
4 unit, wherein said host transceiver unit is connected with said host;  
5           a processor connected with said transceiver and configured to process data  
6 from said host and said human interface device;  
7           a power circuit connected with said processor and configured to regulate the  
8 power usage of said human interface device, wherein said power circuit comprises:  
9           a battery,

a computer readable media having instructions thereon, wherein said instructions comprise

- routines for monitoring the operational state of said human interface device, and
- routines for controlling the operation of said human interface device using said operational state of said human interface device, wherein said routines for controlling the operation of said human interface device comprise a routine for keeping the transceiver off during the periods where the transceiver is not exchanging data with said host transceiver unit.

17. A wireless human interface device configured to establish a link with a host, said device comprising:

- a transceiver for transmitting data to and receiving data from a host transceiver unit, wherein said host transceiver unit is connected with said host;

- a processor connected with said transceiver and configured to process data from said host and said human interface device;

- a power circuit connected with said processor and configured to regulate the power usage of said human interface device, wherein said power circuit comprises:

  - a battery,

  - routines for monitoring the operational state of said human interface device, and

  - a computer readable media having instructions thereon, wherein said instructions comprise

    - routines for controlling the operation of said human interface device using said operational state of said human interface device, wherein said routines for controlling the operation of said human interface device comprise a routine for adjusting the rate of data exchange between said device and said host transceiver unit to a higher rate when said device is transmitting data to said host transceiver unit, from a lower rate used for maintaining a synchronized link with said host transceiver unit.

18. A wireless human interface device configured to establish a link with a host, said device comprising:

3 a transceiver for transmitting data to and receiving data from a host transceiver  
4 unit, wherein said host transceiver unit is connected with said host;

5 a processor connected with said transceiver and configured to process data  
6 from said host and said human interface device;

7 a power circuit connected with said processor and configured to regulate the  
8 power usage of said human interface device, wherein said power circuit comprises:

9 a battery,

10 a computer readable media having instructions thereon, wherein said  
11 instructions comprise

12 routines for monitoring the operational state of said human  
13 interface device, and

14 routines for controlling the operation of said human interface  
15 device using said operational state of said human interface device, wherein  
16 said routines for controlling the operation of said human interface device  
17 comprise a routine for powering down the transceiver and said processor if the  
18 device remains in an idle state for more than a predetermined time period.

19. A wireless human interface device configured to establish a link with a  
2 host, said device comprising:

3 a transceiver for transmitting data to and receiving data from a host transceiver  
4 unit, wherein said host transceiver unit is connected with said host;

5 a processor connected with said transceiver and configured to process data  
6 from said host and said human interface device;

7 a power circuit connected with said processor and configured to regulate the  
8 power usage of said human interface device, wherein said power circuit comprises:

9 a battery,

10 a computer readable media having instructions thereon, wherein said  
11 instructions comprise

12 routines for monitoring the operational state of said human  
13 interface device, and

14 routines for controlling the operation of said human interface  
15 device using said operational state of said human interface device, wherein  
16 said routines for controlling the operation of said human interface device  
17 further comprise a routine for monitoring the battery voltage, and

18 scaling the drive to said motor as a function of said battery  
19 voltage to provide a substantially constant motor output force regardless of the  
20 battery voltage.

1 20. A wireless human interface device configured to establish a link with a  
2 host, said device comprising:

3 a transceiver for transmitting data to and receiving data from a host transceiver  
4 unit, wherein said host transceiver unit is connected with said host;

5 a processor connected with said transceiver and configured to process data  
6 from said host and said human interface device;

7 a power circuit connected with said processor and configured to regulate the  
8 power usage of said human interface device, wherein said power circuit comprises:

9 a battery,

10 a computer readable media having instructions thereon, wherein said  
11 instructions comprise

12 routines for monitoring the operational state of said human  
13 interface device, and

14 routines for controlling the operation of said human interface  
15 device using said operational state of said human interface device, wherein  
16 said routines for controlling the operation of said human interface device  
17 further comprise a routine for reducing the power delivered to said motor  
18 when said battery's voltage level is below a first threshold, and

19 indicating the battery level to an operator of said device.